

An empirical investigation of Web site characteristics, consumer emotional states and on-line shopping behaviors

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Abstract

On-line retailing is rapidly emerging as an alternative mode of shopping and is expected to garner a substantial share of the retail market in future. The low order conversion ratio of Web site visitors and the inability of on-line retailers to attract repeat customers are the main hurdles identified for their lack of success at present. Enhancement of Web site features that facilitate the navigation of the consumer through the purchasing stages is suggested as a means of overcoming these hurdles. The present study proposes the stimulus–organism–response (S-O-R) framework of Mehrabian and Russell [Mehrabian A, Russell JA. An approach to environmental psychology. Cambridge (MA): MIT Press, 1974] as a viable model for the investigation of consumer responses to the Web sites of virtual stores and finds substantial support for its propositions. The paper concludes by offering some directions for Web site design as well as further research in this area.

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Internet shopping is altering the retail landscape by reducing the information search costs of consumers (Hoque and Lohse, 1999) and the transaction costs incurred by the retailers. Electronic retailing, or e-tailing, has emerged only recently and is poised for a takeoff as the digital economy evolves further (Department of Commerce, 2000). While the future growth of e-tailing appears certain according to several forecasts (Ernst and Young, 2000, Department of Commerce, 2000), the success of individual Internet retailers is by no means assured. E-tailer shakeout is already in progress (Green, 2000) and the scramble for the identification of successful e-tail models is on. The need for improving the order conversion ratio (proportion of Web site visitors that actually place a purchase order) and attracting repeat customers are the imperatives for success (Reibstein, 2000). Through better Web site design, e-tailers can expect to improve the order conversion rate, which at present hovers around an abysmal 1.8% (Tedeschi, 2000).

The environment of the virtual storefronts created through Web page design is not unlike the atmosphere of the brick-and-mortar stores with their emphasis on layout,

merchandise displays, lighting, signage and so on. Analogies have in fact been drawn between real and virtual stores and their features compared. Lohse and Spiller (1999) identified the attributes of real stores such as layout and atmosphere and the corresponding characteristics of on-line retail stores.

Whether the retail store is real or virtual, customer interactions with the store environment influence their emotional responses and shopping behaviors (Chang et al., 2002; Novak et al., 2000; Sherman and Smith, 1986; Baker et al., 1992; Donovan et al., 1994; Spies et al., 1997). Underlying much of the retailing research focusing on the influence of store atmosphere on store patronage behaviors is the stimulus–organism–response (S-O-R) framework developed by Mehrabian and Russell (1974) from an environmental psychology perspective. Originally introduced by Donovan and Rossiter (1982) to the retail store context, this framework suggests that store atmosphere affects emotional states of consumers, which, in turn, influence their shopping behaviors.

The present research proposes that the propositions of the S-O-R framework are equally applicable to the context of virtual stores. Based on this framework, hypotheses are developed regarding the relationships between emotional responses of visitors to virtual storefronts and their shopping

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intentions/behaviors. A study is conducted with student subjects and the hypotheses are tested using the data.

1. Literature review

Two streams of literature provide the necessary background for this study. First, the newly emerging set of studies on on-line shopping behaviors of consumers is summarized. Then, prior research on the influence of store atmosphere on the emotional responses and shopping behaviors of consumers is reviewed briefly.

1.1. Electronic retailing/on-line shopping

According a recent [Department of Commerce Report \(2000\)](#), “. . .the evolution of digital business is still in an early stage” and the large investments being made by the retail industry into information technology infrastructure should bear fruit in the future. Several surveys point to the increasing acceptance of on-line shopping by consumers and the continued growth of e-tailing. A recent report from [Ernst and Young \(2000\)](#) indicates that the number of on-line shoppers jumped from 17 million in 1998 to 39 million in the following year. On-line retail sales of goods stood at US\$5.3 billion during the last quarter of 1999 according to the first official measure of e-tail released by the U.S. Bureau of the Census ([Department of Commerce, 2000](#)). Specific measures of consumer shopping behavior such as the number of items purchased and the average amount spent by each shopper indicate an upswing as well ([Ernst and Young, 2000](#)).

Recent studies of electronic shopping have focused on the strategies adopted by e-tailers in order to identify the factors behind retailer success or failure. Of the 10 merchant attributes considered critical to purchasing, those related to Web site design were rated to be fairly important by the nearly 100,000 on-line shoppers surveyed ([Reibstein, 2000](#)). Product representation was ranked first and ease of ordering ranked fifth among the 10 attributes. While Web site navigation and looks were ranked last by the shoppers, [Reibstein \(2000\)](#) suggests that “it very well might be a reason to not shop there.” Drawing data from a survey of shoppers at the 28 stores of a cybermall, [Lohse and Spiller \(1999\)](#) regressed 13 virtual store attributes on the number of unique visitors to the store and sales in dollars. Product lists (especially, those with pictures and descriptive information) showed strong relationships with both traffic and sales, perhaps due to their ability to facilitate navigation and decision making by consumers.

[Swaminathan et al. \(1999\)](#) proposed a model with vendor characteristics, security of transaction, concern for privacy and customer characteristics as predictors of a purchase by consumers and tested it with data from a recent GVU WWW User Survey. While their model explains only 13% of the variance in the likelihood of a purchase, convenience

of using Web vendors alone accounts for 7% of the variance. Frequency of on-line purchases was sought to be explained through a model incorporating demographic, shopping orientation, channel knowledge and perceived channel utility variables by [Li et al. \(1999\)](#). Results of hierarchical regression analysis indicate that the addition of channel utility variables raises the amount of explained variance from 26.9% to 28.9%, a 2% increase. Among the channel utility variables, accessibility, measured through Web site characteristics, is particularly influential.

Theoretical rationale, as well as empirical evidence for the influence of Web site design on shopping behaviors, has been offered by [Hoque and Lohse \(1999\)](#). Using the information cost perspective, they are able to show that the design of user–computer interface affects consumer choice. A recent report from the trade group Shop.org identifies Web page design, site search and checkout process as some of the crucial variables that explain the high rate of shopping cart abandonment by e-tail consumers ([Tedeschi, 2000](#)). Poor labeling of products, clutter and inconvenience are some of the characteristics of Web sites identified in the same report. Improvements in site design, navigation and ease of use could lead to significant gains in conversion rates (of visitors into customers) as well as sales ([Tedeschi, 2000](#)).

Conceptualizing “flow” as a cognitive state experienced during the navigation of the Web, [Novak et al. \(2000\)](#) hypothesized and tested the relationship between on-line experiences and consumer behaviors. Their model incorporates parts of the S-O-R framework and employs same scale items in measuring variables such as arousal and positive affect (pleasure). Their results show that features of Web site such as the ease of ordering and customer support have an impact on arousal, flow and Web exploratory behaviors. They suggest that the relationship between on-line customer experience and marketing outcome variables deserves to be investigated in future research.

1.2. Store atmosphere and shopping behavior

Studies investigating the relationship between store atmosphere and consumer shopping behaviors have relied in the main, on the S-O-R framework proposed by [Mehrabian and Russell \(1974\)](#). According to this framework, emotional states of the individual mediate the influence of the environment on individual behavior. As adapted by [Donovan and Rossiter \(1982\)](#), the model proposed that store environment arouses the basic emotional states of pleasure–arousal–dominance (PAD) in the individual and the emotional states in turn would affect approach and avoidance behaviors of individuals. The results of the exploratory study conducted by [Donovan and Rossiter \(1982\)](#) indicated that while the influence of pleasure on all of the approach/avoidance behaviors was statistically significant, arousal had significant influence only on affiliation measures and dominance on none of the measures.

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